

Fertilization of *Dioscorea rotundata* with poultry manure: effects on nutrient dynamics and nutrient use efficiencies

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Background

- Yam: tropical tuber crop
- High food and market values
- 1st crop after clearing forest
- Requires high soil fertility
- Tradition: no external fertilizer input
- Population growth: pressure on land ↑



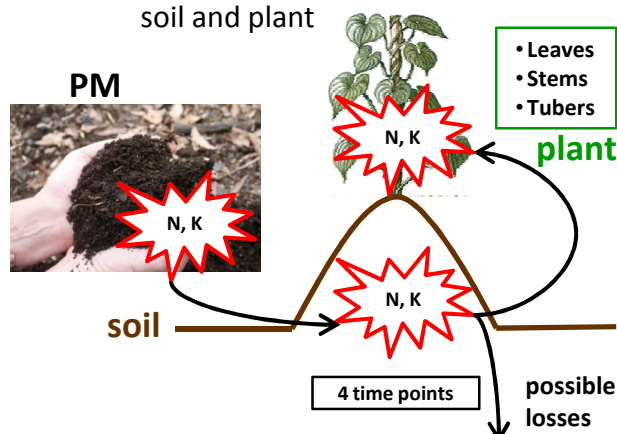
Problem

- Yields far below potential
- Suitable land becoming scarce
- Need for sustainable cropping systems
- Experiment with poultry manure**
- Objective: study effects of PM, fertilizer and their combination on productivity

Similar effects of poultry manure (PM) and mineral fertilizer suggest that PM is a cheap and effective alternative to fertilizers for yam production!

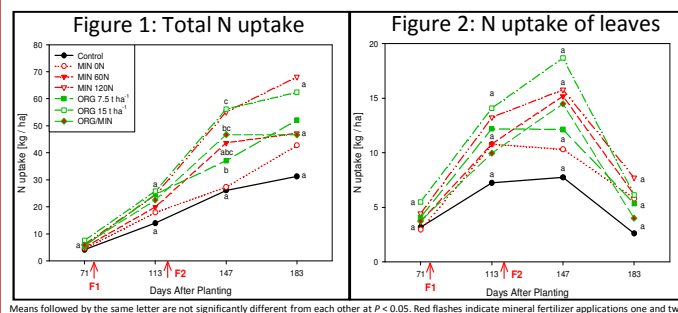
Experiment

- *D. rotundata* cv. TDr 89/02461
- Low fertility savanna soil
- Central Côte d'Ivoire, 2010
- 7 fertilizer treatments:
 - Control (no fertilizer)
 - 3 **mineral fertilizer treat.**, different N applications (0 – 60 – 120 kg N ha⁻¹)
 - 2 **organic fertilizer treat.**, different N applications (60 – 120 kg N ha⁻¹)
 - Combination **mineral/organic** (60 & 60 kg N ha⁻¹)
- Measurements:
 - Soil analysis before and after cropping
 - Elements Ca, Mg, **N**, P and **K** in PM, soil and plant



Results

- N fertilization enhanced N uptake (Figure 1) and prolonged role of leaves as sink for N (Figure 2) but favored shoot over tuber growth
- Mineral fertilizer acted indirectly on yield probably by stimulating soil microbes
- PM had other beneficial effects on crop development than provision of N
- physiological advance of plants and highest yields in PM treatments



Outlook

Future yam research needs to integrate both participative on-farm, and more fundamental on-station trials